

REMARKS/ARGUMENTS

Reconsideration of the application in view of the following remarks is respectfully requested.

Claims 44-71 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,939,721 to Jacobsen in view of Nuss, U.S. Patent No. 5,623,145 and further in view of Zhang, U.S. Patent No. 6,111,416. Applicants respectfully traverse this rejection.

Applicant's invention, as reflected in independent claim 44, is directed to a method of imaging a sample, the method comprising the steps of: (a) irradiating the sample to be imaged with an irradiating beam of pulsed electro magnetic radiation with a plurality of frequencies in the range from 25 GHz to 100 THz; (b) detecting both the radiation transmitted through the sample and the radiation reflected by the sample; and (c) generating an image of the sample from the radiation detected in step (b). Independent claim 62 is directed to apparatus for implementing the method of claim 44.

In accordance with the present invention, an image is generated using both reflection and transmission data. The use of both of these parameters allows the three dimensional compositional structure of an object to be determined and is particularly useful where a full 3D image is not obtainable via transmission or reflection information alone and/or where additional information on objects needs to be determined and scattering or other non specular reflection occurs prevents such information from being obtained using reflection or transmission alone.

Neither Jacobsen '721 nor Nuss '145 nor Zhang '416 either alone or in combination disclose or suggest the use of both reflection and transmission information to develop a 3D image.

Thus, Jacobsen '721 is concerned with the large number of data points generated with a broad spectrum THz pulse interacts with a material (see col. 2, lines 41-44) and proposes a number of compression techniques by which relevant spectroscopic information can be compressed to a smaller set of data points without losing the relevant information contained in the original waveform (see col. 2, lines 60-65 and col. 3, lines 20-22).

Although Jacobsen '721 discusses radiation which is either reflected or transmitted from the sample material, there is no disclosure of the formation of an image using both reflection and transmission. Furthermore, there is no suggestion in Jacobsen '721 to combine both transmission and reflection in order to obtain a 3D image or to collect information from scattering.

Therefore, Applicants respectfully submit that claims 44 and 62 are both novel and unobvious over Jacobsen '721.

Nuss '145 relates to imaging using radiation in the terahertz frequency range. The system disclosed in Nuss '145 discloses only transmission configurations and does not disclose or suggest in any way that imaging using both transmission and reflection should be used to investigate an object.

Therefore, Applicants respectfully submit that claims 44 and 62 are both novel and unobvious over Nuss '145.

Zhang '416 relates to a method and apparatus for characterizing free space electromagnetic radiation. Zhang '416 discloses a device/method that is suitable for two dimensional imaging only (see col. 2, lines 63-67 for example). There is no disclosure or suggestion that both transmission and reflection elements could be utilized simultaneously to form a composite image.

Therefore, Applicants respectfully submit that claims 44 and 62 are both novel and unobvious over Zhang '416.

In summary, none of the references taken alone or in combination either disclose or suggest a method or apparatus for using both transmission and reflection information to obtain a 3D image. Accordingly, it is respectfully submitted that independent claims 41 and 62 are clearly patentable over the combination of Jacobsen '721, Nuss '145 and Zhang '416.

Claims 45-61 are either dependent directly or indirectly from claim 44 and claims 63-71 are dependent either directly or indirectly from claim 62. Accordingly, claims 45-61 and 63-71 are patentable for the same reasons as claims 44 and 62, as well as because of the combination of the features set forth in these claims with the features set forth in the claim(s) from which they depend.

In view of the foregoing this application is now believed to be in condition for allowance, which action is respectfully requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 13, 2004

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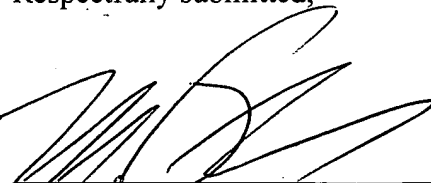
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